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The Animal As Our Farming Partner **By SIR ALBERT HOWARD**

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IN Nature animals and plants lead an interlocked existence. The connection could not be closer, more permanent, or more crucial. We can observe this partnership in operation in the forest, in the prairie, in marshes, streams, rivers, lakes, and the ocean.

If we watch what is taking place in our wayside hedges throughout the year, we at once realize the consequences of this plant-animal relationship. The mixed wastes of the two populations fall on the surface of a soil already rich in organic matter and are automatically converted into still more high-quality humus which is then absorbed and used to feed first the soil population and then the vegetation. Every spring the wildings come into leaf, then into flower, and die down in the autumn before the winter rest. There is practically no disease: no crop failures occur: the services of the plant breeder for raising new varieties are not needed: there are no openings either for the veterinarian or for the plant pathologist. Nature's arrangements obviously succeed for they have passed the supreme trial--the test of time.

In the Far East, in particular, farming and gardening have followed the lead given to us by Mother Earth. Great stress has always been laid on the preservation of live stock and on the fullest use of the waste products of the animal. In India, for example, the cow is looked upon as sacred and its preservation is welded into one of the great religions of this continent. In this way the slaughter of the cattle (maintained for work, for milk, and for manure) in times of scarcity has been prevented: the cow-dung essential for the rice nurseries has been safeguarded: the manure needed for such vital crops as vegetables, fruit, sugar-cane, and vine has been provided. The operations of Nature have thus helped in the make-up of the population, of their religion, and their agriculture. Some of the results obtained recall those of our hedgerows. The indigenous varieties of sugar-cane which still bear their Sanskrit names have always been raised with cattle manure and have maintained themselves for at least twenty centuries without any loss of quality, of disease resistance, or of the power of vegetative reproduction. The vines so widely cultivated on the western frontier tell the same story.

A somewhat similar partnership between crops and live stock began to be firmly established in Great Britain when the defects of the manorial farming of the Middle Ages were made good by enclosure and the laying down of the exhausted open arable fields to grass. This was consumed by great flocks of sheep which furnished the wool needed by the looms of Europe. Mixed farming developed: the Norfolk four-course system was devised and adopted all over the island. It was in full and successful operation on our farm in Shropshire in my early years.

Then a change for the worse began. Our growing industries demanded cheaper food for the workers and cheaper raw materials for the factories. These came in an ever-increasing flood from the virgin lands of the New World. The well farmed fields of Great Britain had to face cheap produce subsidized by the unconscious transfer of the capital of the soils of America to current account. It soon became impossible to farm

on the old Norfolk pattern: the place of the animal as our farming partner had reluctantly to be given up in favour first of the machine and the manure bag, then of various types of monoculture in which live stock had little or even no place. Another development was to concentrate on animals at the expense of the crop, the live stock being fed very largely on feeding stuffs imported from overseas. In such ways the balance between the crop and the animal was destroyed: the self-supporting farms of the nineteenth century became a memory.

Great Britain does not stand alone in her abandonment of the animal as our farming partner or in animal husbandry without locally grown crops to support it. Examples abound all over the world.

Let us first consider some examples of monoculture in which the animal has been banished almost completely. Perhaps the best are furnished by the plantation industries overseas such as tea, coffee, cacao, sugar-cane, rubber, coconuts, bananas, maize, and cotton. A history of ever-advancing disease and the need for a constant stream of new varieties is Nature's reply to this attempt to flout one of her laws. The plantation industries, as at present conducted, are entering into their twilight. They flourished as long as the capital of the virgin soils lasted. There were no animals to help in providing the high-quality humus needed to make good the drain on soil fertility. The result is to be seen in their present sorry plight. But in fairness to these industries, the pioneers have already indicated the road by which present failure can be transformed into future success. Some of the tea, cacao, and coffee estates have already begun to take the animal back into partnership to restore both the fertility of the soil and their own prosperity. One such example is described in Appendix A of *Soil and Health*. An account of some others--coffee in Central America and citrus in Southern Rhodesia--has already appeared.

Great Britain has been much slower than her possessions overseas in the removal of the worst consequences of mono-culture. To maintain production in the potato crop, for example, reliance is still being placed on the manure bag, on the poison spray, and on frequent changes of seed. As will be evident from Professor Newcomb's results; a fertile soil will make the manure bag and the poison spray unnecessary. The experience of the islanders of Tristan da Cunha proves that with organic manuring any variety of potato will last at least a century and the seed need not be changed.

Failure also follows any attempt to concentrate on live stock at the expense of the crop. The periodical disasters of the sheep farming of Australia due to shortage of food in times of drought are notorious. In this country the development of milk production based first on imported feeding stuffs and now on produce largely raised by artificial manures has lowered the power of reproduction of the cow from the normal twelve lactations to round about three. Moreover, many of the animals which yield the nation's milk are rotten with diseases like tuberculosis, contagious abortion, mastitis, and troubles of the alimentary tract.

In all these cases we see the way Nature hits back when her rule about the correct relation between the plant and the animal is disregarded. She is trying to tell us that we shall have to retrace our steps and restore the natural partnership.

But the official advisers of our farmers are doing their utmost to sidetrack Nature's warnings by bolstering up the findings of experiment stations like Rothamsted and those dealing with fruit production where hardly any live stock are to be seen. Animals are still being replaced by artificials and spraying devices. These substitutes are now excused by statements that it is impossible to replace them by high-quality compost because of the absence of the raw materials needed and of the cost of their conversion into humus. These advisers forget that the residues of over forty million people are running to waste, that the correct utilization of sewage sludge has begun, and that the compost age in Great Britain is already dawning. As the small trickle of results grows into an avalanche--as is now happening overseas--it will soon be realized that the animal is our farming partner and no practice and no knowledge which ignores this fact will contribute anything to human welfare or indeed will have any chance either of usefulness or of survival.